SYSTEM AND METHOD FOR EVALUATING RISK OF MORTALITY DUE TO CONGESTIVE HEART FAILURE USING PHYSIOLOGIC SENSORS

Abstract of the Invention

A congestive heart failure (CHF) mortality risk metric is automatically generated using an implantable medical device and, if it exceeds a predetermined threshold, a warning signal is issued indicating a significant risk of mortality due to CHF, perhaps necessitating more aggressive medical therapy. The CHF mortality risk metric is calculated based on a combination of estimated ventilatory response values and the slope of heart rate reserve as a function of predicted heart rates. Ventilatory response is estimated based on detected values of actual heart rate, arterial oxygen saturation, right ventricular 0_2, stroke volume, tidal volume, and respiration rate. Heart rate reserve values are derived from the actual heart rate along with patient age and rest heart rate. The predicted heart rates, which represent the heart rates the patient would achieve if healthy, are derived from activity sensor signals. The CHF mortality risk metric is then calculated as a ratio of ventilatory response and the slope of the heart rate reserve. If the CHF mortality risk metric exceeds a critical threshold value, such as 90, the warning signal is generated. Also described herein are various techniques for estimating ventilatory response.